determining a bit decision representing a demodulation of the consecutive sequence of the modulated sampled signal, the determination made being based on a valid modulated sampled signal located closest to the consecutive sequence of the modulated sampled signal in a constellation.

REMARKS

Initially, in the Office Action dated April 4, 2003, the Examiner has rejected claims 1, 3-7, 9, 10, 12 and 14-24 under 35 USC §102(b) as being anticipated by U.S. Patent No. 4,968,985 (Riggle, et al.). Further, claims 2, 8 and 13 have been rejected under 35 USC §103(a) as being unpatentable over Riggle, et al.

The Examiner has objected to claim 11 as being dependent upon a rejected base claim, but indicates that this claim would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 25 has been allowed.

By the present response, Applicants have amended claim 1 to further clarify the invention. Claims 1-25 remain pending in the present application.

35 USC §102 rejections

Claims 1, 3-7, 9, 10, 12 and 14-24 have been rejected under 35 USC §102(b) as being anticipated by Riggle, et al. Applicants respectfully traverse these rejections.

Riggle, et al. discloses a data modulation system that includes a data modulator that assigns a binary value to the signal recorded in a transition cell based

on the amplitude of the signal in the transition cell, the amplitudes of the signal and adjacent transition cells and system experience and categorizing how recording non-linearities and system noise affect the signals. The demodulator samples a selected number of times the recorded signal and the transition cell for which a binary value is to be determined and the recorded signal in a selected number of transition cells adjacent to that cell. It then converts the amplitude of each of the signal samples to a digital symbol. Next, it concatenates portions of the digital symbols to form an interpretation word. It uses this word to enter a stored lookup table which contains binary values, and assigns to the transition cell signal the binary value associated with the word. The table associates a value with a particular word or group of words based on system experience and the demodulation of known signals into interpretation words. The binary values assigned to a number of cells may be combined to form a code word which may be decoded and corrected using soft decoding techniques.

Regarding claim 1, Applicants submit that Riggle, et al. does not disclose or suggest the limitations in the combination of this claim of, inter alia, a method for demodulating a signal that includes receiving a modulated sampled signal, comparing the consecutive sequence of all possible valid modulated sampled signals, or determining a bit decision representing a demodulation of the consecutive sequence of the modulated sampled signal, the determination made being based on a valid modulated sampled signal located closest to the consecutive sequence of the modulated sample signal in a constellation. The Examiner asserts that the reference character 8 and Figures 1 and 2 of Riggle, et al. discloses Applicants'

claimed receiving a modulated sampled signal. However, reference character 8 in Riggle, et al. is simply a processed read signal which is a signal received from memory that has been amplified and filtered. As shown in Figure 2 of Riggle et al., processed read signal 8 is sampled by A/D converter 16 after it is received. Therefore, this is not receiving a modulated sampled signal, as recited in the claims of the present application. Further, the Examiner asserts that Riggle, et al. reference character 20 discloses comparing the consecutive sequence with all possible valid modulated sampled signals. However, reference character 20 is simply a read only memory (ROM), and does not do any comparing. This is not comparing a consecutive sequence with all possible valid modulated sampled signals, as recited in the claims of the present application.

Moreover, the Examiner asserts that Riggle, et al. at column 4, lines 46-66 discloses determining a bit decision representing a demodulation of the consecutive sequence of the modulated sampled signal where the determination made is based on a valid modulated sampled signal located closest to the consecutive sequence of the modulated sampled signal in a constellation, as recited in the claims of the present application. However, this portion of Riggle, et al. merely discloses that the various bits stored in shift register 18 are concatenated to form an interpretation word or vector used to access a lookup table stored in read only memory 20. The value stored at the address location is then assigned to the transition cell which is associated with the sample stored in ship register 18. After a new sample is taken, the contents of the sample shift register 18 are concatenated to form the interpretation word for the transition cell immediately following the previous transition

cell. The process is repeated for each subsequent transition cell until a value has been assigned to every transition cell for which interpretation words can be formed. This is not determining a bit decision representing a demodulation of the consecutive sequence of the modulated sampled signal where the determination made is based on a valid modulated sampled signal located closest to the consecutive sequence of the modulated sampled signal in a constellation, as recited in the claims of the present application. This portion of Riggle, et al. assigns a value stored in read only memory 20 to a transition cell, and does not determine a bit position representing a demodulation of a consecutive sequence of a modulated sampled signal, as recited in the claims of the present application.

Regarding claims 3-7, 9 and 10, Applicants submit that these claims are dependent on independent claim 1 and, therefore, are patentable at least for the same reasons noted previously regarding this independent claim.

Regarding claim 12, Applicants submit that Riggle, et al. does not disclose or suggest the limitations in the combination of this claim of, inter alia, determining all possible valid modulated waveforms, comparing the received at least one modulated input waveform with the possible valid modulated waveforms, or determining bit decisions representing a demodulation of the at least one modulated input waveform, where each bit decision represents the valid modulated waveform closest to each received at least one modulated input waveform. The Examiner asserts again that reference character 8 in Riggle, et al. discloses receiving at least one modulated input waveform, and that reference character 20 in Riggle, et al. discloses determining all possible valid modulated waveforms. As noted previously,

these reference characters in Riggle, et al. do not disclose, suggest or relate to determining all possible valid modulated waveforms or performing any comparing of a received modulated input waveform with possible valid modulated waveforms, as recited in the claims of the present application.

Moreover, the Examiner asserts that Figures 6 and 7 in Riggle, et al. disclose comparing received input waveform with possible valid modulated waveforms and determining bit decisions representing a demodulation of the modulated waveform. However, Figure 6 in Riggle, et al. is merely a table of transition cell values and associated confidence ratings read from the lookup table and read only memory 20, and Figure 7 is a trellis constructed using the cell values and competence ratings shown in Figure 6. This is not comparing a received at least one modulated input waveform with possible valid modulated waveforms, or determining bit decisions representing a demodulation of the at least one modulated input waveform where each bit decision represents the valid modulated waveform closest to each received at least one modulated waveform, as recited in the claims of the present application.

Regarding claims 14-16, Applicants submit that these claims are dependent on independent claim 12 and, therefore, are patentable at least for the same reasons noted regarding this independent claim.

Regarding claim 17, Applicants submit that Riggle, et al. does not disclose or suggest the limitations in the combination of this claim of, inter alia, a demodulator that includes a quantizer, where the quantizer receives an input modulator waveform and quantizes the input modulated waveform producing quantized data, or a memory device that contains bit decisions representing demodulation of the input

modulated waveform, where the quantized data is used to form an address to the memory device. The Examiner asserts that Figures 1 and 2 in Riggle, et al. discloses these limitations in the claims of the present application, but provides no further portions of Riggle, et al. or other comments to justify these assertions. Figure 1 in Riggle, et al. is merely a functional block diagram of a demodulator, and Figure 2 a functional block diagram of the table lookup detector used in the demodulator. Riggle, et al. does not disclose or suggest anything related to a quantizer that receives an input modulated waveform producing quantized data, where the quantized data is used as an address to a memory device containing bit decisions representing demodulation of the input modulated waveform, as recited in the claims of the present application. As noted previously, these Figures disclose interpretation words used as an address to read only memory 20 where the values stored at the address location is assigned to a transition cell which is associated with samples stored in shift register 18.

Regarding claims 18-24, Applicants submit that these claims are dependent on independent claim 17 and, therefore, are patentable at least for the same reasons noted previously regarding this independent claim.

Accordingly, Applicants submit that Riggle, et al. does not disclose or suggest the limitations in the combination of each of claims 1, 3-7, 9, 19, 12 and 14-24 of the present application. Applicants respectfully request that these rejections be withdrawn, and that these claims be allowed.

35 USC §103 rejections

Claims 2, 8 and 13 have been rejected under 35 USC §103(a) as being

unpatentable over Riggle, et al. Applicants respectfully traverse these rejections and submit that claims 2, 8 and 13 are dependent on one of independent claims 1 and 12 and, therefore, are patentable at least for the same reasons noted previously regarding these independent claims. Accordingly, Applicants submit that Riggle, et al. does not disclose, suggest or render obvious the limitations in the combination of each of claims 2, 8 and 13 of the present application. Applicants respectfully request that these rejections be withdrawn and that these claims be allowed.

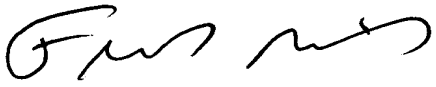
In view of the foregoing amendments and remarks, Applicants submit that claims 1-25 are now in condition for allowance. Accordingly, early allowance of such claims is respectfully requested.

Attached hereto is a marked-up version of the changes made to the claims by the current Amendment. This marked-up version is on the attached pages, the first page of which is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE".

To the extent necessary, Applicants petition for an extension of time under 37 CFR § 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to the Deposit Account No. 01-2135 (Case No. 199.37718X00) and please credit any excess fees to such Deposit Account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend the claims as foillows.

1. (Amended) A method for demodulating a signal comprising:

receiving a modulated sampled signal;

buffering a consecutive sequence of the modulated sampled signal;

comparing the consecutive sequence with all possible valid modulated sampled signals; and

determining a bit decision representing a demodulation of the consecutive sequence of the modulated sampled signal, the determination made being based on a valid modulated sampled signal located closest to the consecutive sequence of the modulated [sample] sampled signal in a constellation.